

WHAT IS CLAIMED IS:

- 1 1. A method of treating an aneurysm, comprising the steps of:
2 providing a device having a cover and a lateral extension, the cover and
3 extension being movable from a collapsed position to an expanded position;
4 advancing the device through a patient's vascular system to an aneurysm with
5 the cover in the collapsed position;
6 moving the lateral extension into the neck of the aneurysm and the cover over
7 the neck of the aneurysm to isolate the aneurysm from the parental vessel.
- 1 2. The method of claim 1, wherein:
2 the providing step is carried out with the cover being a substantially flat
3 element; and
4 the moving step is carried out with the cover being positioned against a wall of
5 the parental vessel around the neck of the aneurysm.
- 1 3. The method of claim 1, wherein:
2 the moving step is carried out with the lateral extension extending laterally
3 outward from a side of the device.
- 1 4. The method of claim 1, wherein:
2 the providing step is carried out with the lateral extension forming at least one
3 loop extending into the aneurysm.
- 1 5. The method of claim 1, wherein:
2 the providing step is carried out with the lateral extension forming 1-8 loops.
- 1 6. The method of claim 1, wherein:
2 the providing step is carried out with the cover extending around no more than
3 half the circumference of the vessel.
- 1 7. The method of claim 1, wherein:
2 the providing step is carried out with the cover extending around no more than
3 one third the circumference of the vessel.

- 1 8. The method of claim 1, further comprising the steps of:
2 coupling at least the lateral extension to a source of energy; and
3 delivering the energy to the lateral extension after the introducing step.
- 1 9. The method of claim 8, wherein:
2 the coupling and delivering steps are carried out with the source of energy
3 being RF energy.
- 1 10. The method of claim 1, wherein:
2 the providing step is carried out with the cover being wrapped around the
3 expandable element.
- 1 11. The method of claim 10, wherein:
2 the providing step is carried out with the cover being wrapped around the
3 expandable element without overlapping folds.
- 1 12. A device for treating an aneurysm, comprising:
2 a cover which covers the neck of the aneurysm to isolate the aneurysm
3 from a parental vessel; and
4 a lateral extension coupled to the cover, the lateral extension extending from
5 the cover and into the aneurysm when the cover is positioned over the neck of the aneurysm.
- 1 13. The device of claim 12, further comprising:
2 the cover comprises a mesh; and
3 the lateral extension comprises a loop.
- 1 14. The method of claim 12, wherein:
2 the cover is a substantially flat element which is positioned against a wall of
3 the parental vessel around the neck of the aneurysm when the lateral extension is positioned
4 in the aneurysm.
- 1 15. The device of claim 12, wherein:
2 the lateral extension forms 1-8 loops.
- 1 16. The device of claim 12, wherein:

2 the providing step is carried out with the lateral extension forming only one
3 loop.

1 17. The device of claim 12, wherein:
2 the loop has a first side attached to the cover.

1 18. The device of claim 12, wherein:
2 the loop is slidable relative to the cover when the loop expands.

1 19. The device of claim 12, wherein:
2 the cover extends no more than about 180 degrees around a longitudinal axis
3 of the device when expanded so that side branch vessels are not occluded by the cover.

1 20. The device of claim 12, wherein:
2 the cover extends no more than about 120 degrees around the longitudinal axis
3 when expanded so that side branch vessels are not occluded by the cover.

1 21. The device of claim 12, further comprising:
2 a source of energy coupled to at least the lateral extension.

1 22. The device of claim 21, wherein:
2 the source of energy is RF energy.

1 23. The device of claim 21, wherein:
2 the cover does not conduct the energy when the lateral extension conducts
3 energy from the source of energy.

1 24. The device of claim 12, wherein:
2 the cover comprises a mesh.

1 25. The device of claim 12, further comprising:
2 a delivery catheter having at least one lumen; and
3 a first manipulator extending through the at least one lumen and releasably
4 coupled to the lateral extension.

1 26. The device of claim 12, further comprising:
2 a second manipulator releasably coupled to the cover.

1 27. A method of treating an aneurysm, comprising the steps of:
2 providing a cover which is positioned around an expandable element in a
3 collapsed position, the cover being covered by a sheath;
4 advancing the cover to an aneurysm in a patient with the cover in the collapsed
5 position;
6 withdrawing the sheath to expose the cover;
7 expanding the expandable member thereby expanding the cover, the cover
8 expanding to an expanded condition, the cover being positioned over a neck of the aneurysm.

1 28. The method of claim 27, wherein:
2 the providing step is carried out with the cover being wrapped around the
3 expandable element without creating folds when collapsed.

1 29. The method of claim 27, wherein:
2 the expanding step is carried out with the cover engaging a wall of the parental
3 vessel around the neck of the aneurysm.

1 30. The method of claim 27, wherein:
2 the expanding step is carried out with the cover being attached to the wall.

1 31. The method of claim 30, wherein:
2 the providing step is carried out with an adhesive positioned on an outer
3 surface of the cover and protected by the sheath during the advancing step.

1 32. The method of claim 27, wherein:
2 the expanding step is carried out with the cover extending no more than half
3 the circumference of the vessel.

1 33. The method of claim 27, wherein:
2 the expanding step is carried out with the cover extending no more than one
3 third the circumference of the vessel.

1 34. The method of claim 27, wherein:

2 the providing step is carried out with the cover having a metallic frame
3 structure and an impermeable portion mounted to the frame, the impermeable portion being
4 positioned to cover the neck of the aneurysm after the inflating step.

1 35. The method of claims 27, wherein:
2 the providing step is carried out with the sheath being folded over itself at a
3 distal end; and
4 the exposing step is carried out with the sheath being pulled back over itself.

1 36. The method of claim 27, wherein:
2 the providing step is carried out with the sheath comprising PTFE.

1 37. The method of claim 27, wherein:
2 the cover is mounted to a delivery catheter, the delivery catheter having a
3 single lumen; and
4 the advancing step is carried out with the device being advanced over a
5 guidewire extending through the single lumen.

1 38. A device for treating an aneurysm, comprising:
2 a cover for covering a neck of an aneurysm
3 a delivery catheter having an expandable element and a sheath, the cover being
4 mounted around the expandable element, the sheath being retractable and overlying the cover
5 thereby trapping the cover between the sheath and expandable element, the sheath being
6 movable to a position in which the cover is exposed to permit expansion of the expandable
7 element and the cover.

1 39. The device of claim 38, wherein:
2 the delivery catheter has a longitudinal axis; and
3 the cover is wrapped around the balloon in the collapsed position without
4 folds.

1 40. The device of claim 38, further comprising:
2 an adhesive on an outer surface of the cover.

1 41. The method of claim 38, wherein:

2 the cover has a metallic frame and an impermeable portion mounted to the
3 frame which covers the neck of the aneurysm.

1 42. The method of claims 38, wherein:
2 the sheath is folded over itself at a distal end, the sheath being pulled back
3 when exposing the cover.

1 43. The method of claim 38, wherein:
2 the sheath comprises PTFE.

1 44. The method of claim 38, wherein:
2 the delivery catheter has a single lumen which receives a guidewire:

1 45. A device for treating an aneurysm, comprising:
2 a proximal hub;
3 a distal hub; and
4 a plurality of filaments extending between the proximal and distal hubs, the
5 filaments biasing the proximal and distal hubs towards one another when moving from a
6 collapsed position to an expanded position.

1 46. The device of claim 45, wherein:
2 the plurality of filaments are 2-16 filaments.

1 47. The device of claim 45, wherein:
2 the plurality of filaments form a generally concave surface which covers a
3 neck of an aneurysm when positioned in the aneurysm.

1 48. The device of claim 45, wherein:
2 the plurality of filaments form a generally convex surface opposite the concave
3 surface.

1 49. The device of claim 45, further comprising:
2 a catheter having a lumen; and
3 a manipulator extending through the lumen and contacting the proximal hub.

1 50. The device of claim 45, further comprising:
2 a source of power coupled to the manipulator.

1 51. The device of claim 50, wherein:
2 the source of power is an RF generator.

1 52. A device for filling an aneurysm, comprising:
2 a catheter having a lumen;
3 a plurality of filaments each having a proximal end and a distal end, the
4 plurality of filaments being coupled together at the proximal ends and each of the filaments
5 extending to a free end at the distal end, the plurality of filaments being in a collapsed
6 condition when positioned in the lumen of the catheter, the plurality of filaments expanding
7 to occupy a space in an aneurysm when advanced out of the lumen in the catheter.

1 53. The device of claim 52, wherein:
2 the plurality of filaments are in a straightened configuration when collapsed
3 within the catheter.

1 54. The device of claim 52, wherein:
2 each of the plurality of filaments forms a coil in the expanded position.

1 55. The device of claim 54, wherein:
2 the coils formed by the plurality of filaments each have a central axis with the
3 central axes of the coils generally lying in a plane.

1 56. The device of claim 54, wherein:
2 the coils formed by the plurality of filaments each have a central axis with the
3 central axis of the coils being angled relative to one another by about 90-120 degrees.

1 57. The device of claim 52, wherein:
2 the plurality of filaments are 2-4 filaments.

1 58. A method of treating a cerebral aneurysm, comprising the steps of:
2 providing an expandable structure movable from a collapsed shape to an
3 expanded shape;
4 introducing the expandable structure into a blood vessel of a patient;
5 advancing the expandable structure through the patient's vasculature to a
6 cerebral aneurysm while the expandable structure is in the collapsed position;

- 7 moving the expandable structure into the cerebral aneurysm;
- 8 expanding the expandable structure to the expanded position in the cerebral
- 9 aneurysm;
- 10 shrinking the wall of the aneurysm; and
- 11 leaving the expandable structure in the aneurysm after the shrinking step.